# Broadband For Michigan Libraries

Introduction to Broadband

## What is Broadband?

- A fast Internet connection
- FCC definition: 200 kbps in each direction
- Slower connections defined as narrowband
- Future of the Internet: faster and faster connections to enable new applications

## “Killer Apps” for Broadband

- “Killer Apps” are the applications that drive adoption and use
- Interactive services
  - Databases
  - Realtime video/audio
  - Web surfing

## Killer Apps (cont'd)

- Streaming
  - Video/audio
  - Applications
- Large file transfers
  - Online/offsite backups
  - Distributed databases
  - Rich media files
  - Peer to peer

## Broadband and Libraries

- Broadband promises better services for libraries
  - Better access to databases (OCLC, Lib. of MI, etc.)
  - Access to online courseware and video with minimal delays
- Broadband being provided to library users at home, so they'll expect it at libraries
- Can serve as a springboard to bring users to libraries if they don't have broadband at home

## Broadband and Libraries (cont'd)

- Alternative technologies provide significant cost savings to libraries
  - Costs dropping over time
  - Alternative technologies driving costs down
  - Dot-com boom means lots of fiber in the ground, which means more bandwidth available

## Broadband vs. Narrowband

- Broadband is much faster than narrowband
  - Fastest narrowband is 200kbps – common narrowband is 56kbps
  - Really fast broadband is OC-192 (10GB, or approx. 100,000,000 kbps – 2 million times as fast as a modem)
- Broadband much more reliable than narrowband

## Technologies for Broadband

- Variety of different technologies for broadband (both business and residential)
  - Cable Modem (over cable TV)
  - Satellite
  - DSL (over telephone lines)
  - Fiber Optics (over dedicated lines)
- Overall, broadband available to 80% of homes and 90% of businesses
  - Less available in rural/insular areas
  - Michigan has less than its fair share of availability

## Cable Modems

- Delivered over cable TV lines (2 channels)
- Benefits of Cable Modems
  - Very fast
    - Speeds up to 3 Mbps avail. today (most users get about 500kbps down and 128kbps up)
    - Technically capable of up to 27 Mbps
  - Fairly widely available – depends on your local cable company (and local cable regulators)

## Cable Modems (cont'd)

- Problems with Cable Modems
  - Shared connection
  - Some cable companies do a much better job than others
- Costs
  - Vary widely -- $40 - $60 for residential service to $200+ for "professional" service

## Satellite Broadband

- Provided over satellite dish
  - GSO Satellites
  - Comes in two flavors – digital return and analog return
- Benefits of Satellite
  - Widely available – need a view to the southern sky

## Satellite Broadband (cont'd)

- Disadvantages of Satellite
  - Relatively slow download (200 kbps – 600 kbps)
  - High latency (serious problem for interactive services, such as video)
  - Analog return
  - Can be impeded by weather
- Costs vary widely -- $70/mo. – $200/mo.

## DSL (Digital Subscriber Line)

- DSL provided over phone lines by phone company (or phone competitor)
- Speeds vary widely
  - Downloads at anywhere from 256 kbps to 10 Mbps (avg. is 700 kbps down and 128 kbps up)
  - Different technologies – asynchronous, synchronous, etc.

## DSL (cont'd)

- Benefits of DSL
  - Different speed packages available
  - Dedicated connection
- Disadvantages of DSL
  - Generally slower than cable
  - Only available within 15,000 line-feet of phone company switch (not viable or available in many rural areas)
- Costs vary widely, depending on level of service, ISP, and sometimes number of computers
  - Different ISPs have different packages (and different quality of service)
  - Costs range from $50/mo. to $300/mo.+

## Wireless

- Many different kinds of wireless available
  - Service providers range from large companies (e.g. Sprint) to local ISPs to educational institutions
  - Capabilities, speeds, reliability vary dramatically from one technology to another (and one provider to another)

## Wireless (cont'd)

- Wi-Fi (802.11) becoming extremely popular
  - Can use for local area network (omnidirectional antenna) or long distance (directional antenna)
  - 802.11b (most popular) supports speeds up to 11Mbps; 802.11a and 802.11g support 54 Mbps
  - Inexpensive to deploy
- ITFS also a possibility
  - Licensed to educational institutions
  - Long range, good reliability
  - Technology for providing broadband over ITFS just emerging

## "Fiber Optics"

- Wide variety of fiber optic-type dedicated lines
  - Fractional T-1, T-3, OC-3, OC-12
  - Generally provided by the phone company or a partner
  - Used in this context to refer to traditional dedicated lines, not just fiber optic connections
- Benefits of Fiber Optics
  - Good reliability
  - *Almost* universally available

## Fiber Optics (cont'd)

- Disadvantages of Fiber Optics
  - Cost
  - Cost
  - Cost
- Costs of Fiber Optics
  - Varies based on distance
  - Can range from a few hundred dollars a month to thousands for frac T-1 or T-1
  - T-3 or OC-12 cost thousands and thousands per month

## Broadband and Services to Unemployed

- Goal of grants program is to help libraries seeking to provide services to the unemployed
  - Broadband upgrades will allow libraries to serve more users at less long term cost
  - Broadband will provide users with a better experience than narrowband, helping encourage them to make use of library facilities for unemployment searches